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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,813	11/13/2001	Samuel C. Lay	MCD124	3067

7590

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EXAMINER

PHAN, MAN U

ART UNIT

PAPER NUMBER

2665

DATE MAILED: 03/10/2004

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/010,813

Applicant(s)

LAY ET AL.

Examiner

Man Phan

Art Unit

2665

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 December 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 2,20 and 21 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4,5,9,10,14,15,18,19,22 and 23 is/are allowed.
- 6) ☒ Claim(s) 1,3,6-8,11-13,16-18,24 and 25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Response to Amendment and Argument

1. This communication is in response to applicant's 12/15/2003 Amendment in the application of Lay et al. for a "Method and apparatus for providing optimized high speed link utilization" filed 11/13/2001. The proposed amendments to the claims have been entered and made of record. Claims 2 and 20-21 have been cancelled per applicant's request, and claims 1, 4-6, 9, 14, 19, 24 have been amended. Claims 1, 3-19 and 22-25 are pending in the application.

In view of applicant's amendment to amend the specification and claims 1, 6, 24 to obviate the objection, examiner has withdrawn the Objections of record.

The rejection of record with respect to claims 2 and 21 under 35 U.S.C. § 112, second paragraph are hereby removed based on applicant's amendment.

2. Applicant's amendment and argument to the rejected claims are insufficient to distinguish the claimed invention from the cited prior arts or overcome the rejection of said claims under 35 U.S.C. 103 as discussed below. Applicant's argument with respect to the pending claims have been fully considered, but they are not persuasive for at least the following reasons.

3. The reference of record - Nelson et al. (US#6,148,004) is a U.S. patent or U.S. patent application publication of a pending or patented application that claims the rejected invention. An affidavit or declaration is inappropriate under 37 CFR 1.131(a)

Art Unit: 2665

when the reference is claiming the same patentable invention, see MPEP § 2306. If the reference and this application are not commonly owned, the reference can only be overcome by establishing priority of invention through interference proceedings. See MPEP Chapter 2300 for information on initiating interference proceedings. If the reference and this application are commonly owned, the patent may be disqualified as prior art by an affidavit or declaration under 37 CFR 1.130. See MPEP § 718.

4. Applicant's argument with respect to the rejected claims 1, 13, 18 and 24 (pages 13-14) that the cited reference does not disclose the use of "byte stripping FC frames". However, Nelson teaches in Fig. 1 a block diagram illustrated a port module 10 for the establishment of dynamic ESCON connections from FC frames in conjunction with a conventional eight port module of a ESCON director point to point switch 12 (*dividing a single high data rate frame and spread it across plural lower data rate data lanes*), in which the link controllers 22 function to convert Fibre Channel sequences into ESCON frames and vice versa. Nelson teaches in Figs. 2A&B the flow chart illustrated depicts the processing of frames received from the Fibre Channel, in which following receipt of a Fibre Channel frame header at step 102, the process 100 proceeds to perform FC-4 processing (*FC-4 defines the mapping between the lower levels of Fibre Channel and the command sets that use it*) at decision step 50 (Fig. 2B). If the frame header indicates an FC-4 frame, then the process 100 returns directly to decision step 104 (Fig. 2A). Otherwise, at step 52 the frame is forwarded to the LP 30 as the frame is an FC-2 extended or basic link service frame (*byte striping techniques*). At decision step 54, if the

frame is valid, the descriptor is passed to the LP 30 at step 56, otherwise the LP 30 descriptor is reclaimed at step 58 (Col. 4, lines 15 plus). Furthermore, the byte striping or word striping is well known striping methods for transmitting data frames across links especially in Fibre Channel Frames. Byte striping is implemented to divide a single high data rate frame and spread it across plural lower data rate data lanes, and is a standard technique of ten gigabit attachment unit interface (XAUI) module that is specified in the IEEE802.3ae 10 Gigahertz (GHz) Fibre Channel standard document as admitted by the applicant (See the Specification, page 9).

Applicant further alleges that the cited references to Nelson et al. (US#6,148,004) and Kalkunte et al. (US#6,567,417) not show or suggest the “*coupling to ports on a switching element*” (pages 13-14). However, Nelson is applied herein merely for the teaching of a method and apparatus for the establishment of dynamic ESCON connections switches from Fibre Channel, and Fig. 1 is a functional block diagram of a port module for the establishment of dynamic ESCON connections from Fibre Channel frames illustrated in conjunction with a conventional eight port module of an ESCON Director point-to-point switch, in which a plurality of data ports comprise bidirectional ports of an ESCON cross point switch. (*determining a destination port on a switching element*) (Col. 3, lines 29-34 and Col. 12, lines 19-20). Therefore, examiner maintains that the references cited and applied in the last office actions for the rejection of the claims are maintained in this office action.

Claim Rejections - 35 USC ' 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 1038 and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1, 6, 11-13 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. (US#6,148,004) in view of Kalkunte et al. (US#6,567,417).

With respect to claims 1, 13 and 24-25, Nelson et al. discloses a novel system and method for the establishment of dynamic connection from Fibre channel frames. Nelson

Art Unit: 2665

teaches in Fig. 1 a functional block diagram illustrating a port module 10 receives data frames on a Fibre Channel (FC) bus 14; a FC front end 16 coupled to the fibre data interface for transmitting and receiving byte striped FC frames; a route controller (*matrix controller*) coupled to the front end 16 for route processing of the FC frames; and a backplane data interface operative for coupling to a plurality of ports (260-267) on a switching element 12 (Col. 3; lines 29 plus, and Col. 12, lines 22 plus). However, Nelson does not expressly disclose a Fibre data interface that is adapted to be coupled to a 10.2 gigabit per second link. In the same field of endeavor, Kalkunte teaches a method for providing a switching fabric that allows for rapid communication between the switches. The fabric supports link aggregation (trunking) of its eight 10 Gbps ports. Up to 4 trunk groups can be supported, each up to maximum of four members. The Trunk Group Table is used to derive the egress port when a packet has to go out on a trunk port. The RTAG is picked up from the Trunk Group Table by the trunk distribution logic to determine the distribution algorithm (See Figs. 2 & 3; Col. 4, lines 48 plus). Fibre Channel and Gigabit Ethernet are high speed data transfer interfaces that can be used to interconnect workstations, mainframes, supercomputers and storage devices.

With respect to claims 6 and 11-12, Nelson further teaches in Fig. 1 a functional block diagram illustrating a port module 10 receives data frames on a Fibre Channel (FC) bus 14, includes the link controllers 220 through 227 to which to direct a frame based upon the Originator Exchange Identifier (OX_ID). Once a "bind" has been established to a particular one of the link controllers 220 through 227, all subsequent frames with the

Art Unit: 2665

same exchange identifier are automatically routed to the correct link controller 22 by the Fibre Channel front end 16 (Col. 3; lines 43 plus).

One skilled in the art would have recognized the need for effectively and efficiently providing link aggregation in the Fibre Channel switching architecture, and would have applied Kalkunte's novel use of the network switch fabric in the fast Ethernet into Nelson's teaching of the Fibre Channel port module. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Kalkunte's frame forwarding in a switch fabric into Nelson's method and apparatus for establishment of dynamic ESCON connections from Fibre Channel frames with the motivation being to provide a method and system for providing link aggregation in a Fibre Channel fabric.

8. Claims 3, 7-8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson et al. (US#6,148,004) in view of Kalkunte et al. (US#6,567,417) as applied to the claims above, and further in view of Azizoglu et al. (US#6,430,201).

With respect to claims 3 and 7-8, Nelson and Kalkunte disclose the claimed limitations discussed in paragraph 8 above. However, Nelson and Kalkunte et al. do not expressly disclose the claimed feature of the integrated serializer/deserializer (ISD) modules, and the use of 8B/10B encoding scheme in the Fibre Channel port module. In the same field of endeavor, Azizoglu et al. teaches in Fig. 2 a block diagram illustrated the transmit side of a high speed line interface supporting multiple Gigabit Ethernet (GbE) and Fibre Channel (FC) signals, in which each of the two GbE inputs is first

Art Unit: 2665

converted into a 10-bit parallel stream by a corresponding *serializer/deserializer* (*Ser/Des*) 20-1 or 20-2. The 10-bit parallel streams are then decoded by *8b/10b codecs* 22-1 and 22-2, which remove the run-length code overhead from each stream. Each codec 22-1 and 22-2 provides error information to performance monitoring (PM) logic 24 which monitors the bit error rate (BER) performance of the GbE signals. The output of each codec 22-1 and 22-2 is an 8-bit parallel stream at a bit rate of 1 Gb/s. A ninth bit is added to indicate whether a byte has originated from a special type of character called a "K-character" used in GbE systems. GbE employs these K-characters for the exchange of control information, such as the indication of start and end of a packet, idle channel status, etc. Since all 256 8-bit characters occur within the data, a ninth bit is necessary to indicate the presence of a K-character. As a result, the aggregate rate at the output of the two 8b/10b codecs 22-1 and 22-2 is 2.25 Gb/s. The rate-reduced streams are supplied to multiplexing and framing logic 26, which multiplexes the streams together using an asynchronous statistical multiplexing technique described, and maps the multiplexed streams into synchronous frames in the OC-48 signal (Col. 4, lines 39 plus).

Regarding claim 18, It's a method claim corresponding to the claims 1, 3, 6-8, 11-13 and 24-25 above. Therefore, claim 18 is analyzed and rejected as previously discussed in paragraphs 7 & 8 above with respect to claims 1, 3, 6-8, 11-13 and 24-25.

One skilled in the art would have recognized the need for effectively and efficiently providing link aggregation in the Fibre Channel switching architecture, and would have applied Azizoglu's multiplexing method using serializer/deserializer and 8b/10b codecs, and Kalkunte's novel use of the network switch fabric in the fast Ethernet

into Nelson's teaching of the Fibre Channel port module. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Azizoglu's method and apparatus for transporting Gigabit Ethernet (GbE) and Fibre Channel (FC) signals in wavelength division multiplexed systems, and Kalkunte's frame forwarding in a switch fabric into Nelson's method and apparatus for establishment of dynamic ESCON connections from Fibre Channel frames with the motivation being to provide a method and system for providing link aggregation in a Fibre Channel fabric.

Allowable Subject Matter

9. Claims 4-5, 9-10, 14-15 and 19, 22-23 are allowable as evident by applicant's amendment.

10. The following is an examiner's statement of reasons for the indication of allowable subject matter: The closest prior art of record fails to disclose or suggest a Fibre Channel port module wherein the data output from the sublayer comprises four lanes of octet data at 318.75 MHZ, and the Integrated Seralizer/Desrializer (ISD) modules comprise four ISD modules each operating at a data rate of up to 3.1875 gigabits per second, as specifically recited in the claims 4-5, 14-15 and 19, 22-23. The closest prior art of record also fails to disclose or suggest wherein the fibre channel further comprising a frame writer coupled to the front end for storing fibre channel data in the buffer memory, the frame writer configured to handle a throughput at a data rate of 10.2

Art Unit: 2665

gigabit per second; wherein the buffer memory is configured to handle a 10.2 gigabits per second write and six simultaneous 1.7 gigabit per second reads, as recited in claims 9-10.

11. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Nelson et al.(US#6,192,048) is cited to show the method and apparatus for implementing hunt group support for a crosspoint controller.

The Mitchem et al.(US#6,606,322) is cited to show the route look up caching for a fiber channel switch.

The George (US#6,697,359) is cited to show high performance switch fabric element and switch systems

The banks et al. (US#6,160,813) is cited to show fibre channel switching system and method.

Art Unit: 2665

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION THIS ACTION IS MADE FINAL**. See MPEP ' 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

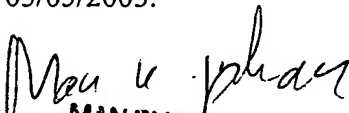
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (703)305-1029. The examiner can normally be reached on Mon - Fri from 6:30 to 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached on (703) 308-6602. The fax phone number for the organization where this application or proceeding is assigned is (703)305-3988.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Mphan

03/05/2003.


MAN PHAN
PATENT EXAMINER